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History and clinical signs

An 18-month-old, neutered male, Chinese crested dog was referred to the dermatology referral service at the Ontario Veterinary College for evaluation of recurrent pustular lesions affecting the dorsum that developed at 10 mo of age. The owner described the dog as being only sporadically pruritic. The only previous therapy the dog had received was periodic bathing with a moisturizing shampoo (Allergroom; Virbac, St. Lazare, Quebec).

On presentation, the dog was hairless, except for the head, tail, lower limbs, and a strip over the dorsal spine. Papules, pustules, large keratin-plugged comedones, and several depigmented nodules were noted over the dorsal and ventral surfaces of the neck and lateral aspect of the thighs (Figure 1). Smaller pinpoint 'blackhead' comedones were generalized over the trunk. Pruritus was not noted at the time of the referral examination.

Figure 1. Dorsal surface of the neck showing pustules, ruptured pustules, and large numbers of comedones.

What is your clinical diagnosis and therapeutic plan?

Differential diagnoses for recurrent pustules with pruritus would include ectoparasitic skin diseases, such as sarcoptic mange and demodicosis; hypersensitivity disorders (atopy, adverse food reaction); superficial pyoderma; hypothyroidism; and pemphigus foliaceus. Based on the history of recurrent pustules, papules, and comedones in a hairless breed, a superficial pyoderma, secondary to the hairless nature of the breed, was suspected, but definitive diagnosis required skin biopsy.

Skin scrapings were negative for ectoparasites, including *Demodex* and *Sarcoptes* spp. Results from a complete blood (cell) count, serum biochemical profile, urinalysis, and total T4 with endogenous TSH revealed no significant abnormalities. Multiple skin biopsies, representing the range of clinical lesions, were taken with a 6-mm punch, under sedation with medetomidine (Domitor; Novartis, Mississauga, Ontario), from lesions on the dorsum of the head, lumbar region, and rear thighs. In all sections examined histologically, hair follicle density was normal but the majority of follicles were markedly dilated, filled with keratin debris (comedones) (Figure 2). Multiple distended follicles had ruptured, resulting in a severe furunculosis with infiltration by neutrophils and histiocytes. In a single section, hyperplastic sebaceous glands surrounded atrophic hair follicles. The epidermis was mildly thickened with increased keratin deposition (orthokeratotic hyperkeratosis), and melanin pigment was prominent within the basal epithelial layer. The histological diagnosis was severe suppurative furunculosis with marked follicular dilation (comedones).

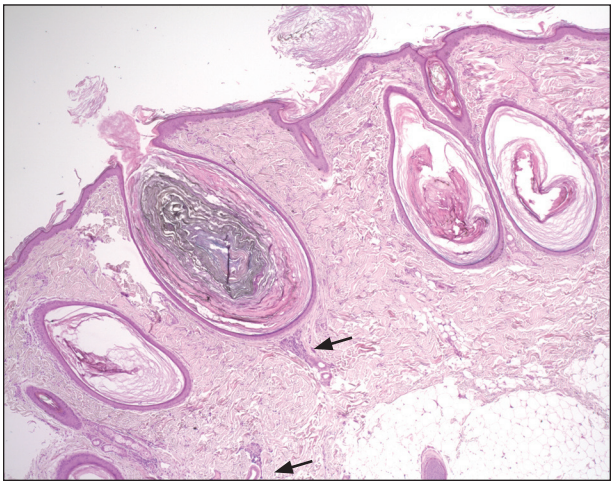

Figure 2. Multiple dilated hair follicles filled with keratin debris. The normal adnexal glands (sweat and sebaceous glands, marked by arrows) appear quite small adjacent to the markedly dilated follicles. 40× magnification.

The dog was treated with cephalexin (Novolexin; Novopharm, Toronto, Ontario), 30 mg/kg bodyweight (BW), PO, q12h for 8 to 12 wk pending re-evaluation. Shampoo therapy with benzoyl peroxide (Pyoben; Virbac) once weekly, followed by a soothing conditioning oatmeal rinse (Resisoothe, Virbac) was also recommended. At reevaluation 8 wk later, the skin was much improved. All of the pustules had resolved, although pinpoint comedones were still generalized over the trunk. Pruritus had not been observed in the intervening period, suggesting

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that an underlying hypersensitivity disorder was unlikely. The owner was advised to continue the shampoo therapy on a long-term basis but to watch for evidence of excessive drying of the skin. The owners have accepted that long-term management of the condition will be required.

Discussion

Congenital hair abnormalities may be noted at birth, ranging from complete absence of hair to reduced hair numbers or miniaturization of hair follicles (1). Some individuals only have hair follicle abnormalities, whereas others may have abnormalities affecting other skin appendages, dentition, or tear production. A classification of defects has been suggested (2).

The Chinese crested dog, Mexican hairless dog, and sphinx cat represent alopecic breeds. They result from a spontaneous genetic mutation leading to a loss of hair follicles. In the Chinese crested dog, like the Mexican hairless dog, an autosomal dominant trait has been identified (3). The Chinese crested dog is devoid of hair except for the crown of the head, lower part of the limbs, and tail. The characteristic appearance of the breed is produced by a dominant gene for hypotrichosis (Hr) in combination with the gene for long hair. The homozygote HrHr is a prenatal lethal, hence the Chinese crested dog is an obligate heterozygote.

Although Chinese crested dogs are hairless, the sebaceous glands are still present, opening into rudimentary hair follicles, and apocrine ducts open on to the skin surface. The epidermis is thicker than normal and often feels quite greasy. Alopecic breeds are prone to seborrhea oleosa, comedones, and recurrent bacterial and *Malassezia* sp. infections. The mechanism of comedone development is believed to be associated with the failure of vellus hairs to develop into terminal hairs (4). The follicular ducts are occluded by sebum from hyperplastic sebaceous glands and keratin produced by hyperkeratosis of the follicular epithelium. Because of a lack of hair, hairless breeds are also more sensitive to chemical irritation and ultraviolet irradiation, which can induce comedone formation, sebaceous gland hyperplasia, and inflammation (5–8).

There are no specific treatment options. Secondary bacterial folliculitis may be a recurrent problem. Prophylactic care is often necessary to manage these breeds. Frequent bathing using shampoos containing keratolytic agents, such as sulfur and salicylic acid, may be beneficial. The use of emollient rinses and humectants may help to maintain the moisture level within the skin. Retinoid therapy has been suggested for severely affected individuals (9). Administration of a synthetic retinoid, such as acitretin (Soriatane; Roche, Hoffman-La-Roche, Mississauga, Ontario), 0.5 to 1.0 mg/kg BW, PO, q24h, or isotretinoin (Accutane; Hoffman-La-Roche), 1 to 2 mg/kg BW, PO, q12 to 24h, may be beneficial. Secondary bacterial and yeast infections should be controlled with appropriate therapy. If *Malassezia* sp. involvement is strongly suspected, a treatment trial with ketoconazole (Nizoral; Janssen-Ortho, Toronto, Ontario), 5 to 10 mg/kg BW, PO, q12 to 24h for 30 d, or itraconazole (Sporonox; Janssen-Ortho), 5 mg/kg BW, PO, q24h for 30 d, should be considered.

This case highlights the fact that hairless breeds are not truly hairless despite their lack of hair, having rudimentary hair follicles that may develop comedones and secondary pyoderma. Diligent monitoring of the skin by both owner and veterinarian is required, with associated prophylactic treatments to prevent inflammatory flare-ups in the sensitive skin of these "hairless" breeds.

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